

On beyond Star Trek: Synthetic biology and the future of space exploration

Lynn J. Rothschild

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A turtle carries its own habitat. While it is reliable, it costs energy. NASA makes the same trade-off when it transports habitats and other structures needed to lunar and planetary surfaces increasing upmass, and affecting other mission goals. Long-term human space presence requires periodic replenishment, adding a massive cost overhead. Even robotic missions often sacrifice science goals for heavy radiation and thermal protection. Biology has the potential to solve these problems because it can replicate and repair itself, and do a wide variety of chemical reactions including making food, fuel and materials. Synthetic biology enhances and expands life's evolved repertoire. Using organisms as feedstock, additive manufacturing could make possible the dream of producing bespoke tools, food, smart fabrics and even replacement organs on demand. Imagine what new products can be enabled by such a technology, on earth or beyond!